PATENT COOPERATION TREATY

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From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)* see form PCT/ISA/210 (second sheet)	
Applicant's or agent's file reference see form PCT/ISA/220	**FOR FURTHER ACTION** See paragraph 2 below
International application No. PCT/JP2006/303523	International filing date *(day/month/year)* 21.02.2006
Priority date *(day/month/year)* 13.06.2005	
International Patent Classification (IPC) or both national classification and IPC INV. H01L33/00 H01S5/042 H01L21/285 H01L29/45	
Applicant KABUSHIKI KAISHA TOSHIBA	

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	see form PCT/ISA/210	van der Linden, J.E. Telephone No. +31 70 340-4525

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2006/303523

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material:

      ☐ on paper

      ☐ in electronic form

   c. time of filing/furnishing:

      ☐ contained in the international application as filed.

      ☐ filed together with the international application in electronic form.

      ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	2,3,6-8,10,14,16,20
	No:	Claims	1,4,5,9,11-13,15,17-19
Inventive step (IS)	Yes:	Claims	2,3,10,14,16,20
	No:	Claims	1,4-9,11-13,15,17-19
Industrial applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the International application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

The following documents are referred to in this communication:

D1 : EP 1 450 414 A (NICHIA CORP) 25 August 2004
D2 : WO 2004/047189 A (LG INNOTEK CO) 3 June 2004
D3 : US 6 586 328 B1 (ADESIDA I ET AL) 1 July 2003

1 Art. 6 PCT

The application does not meet the requirements of Art. 6 PCT, in that the matter for which protection is sought is not clearly defined. This lack of clarity is such that it influences the assessment of novelty and/or inventive step under Art. 33(2) and 33(3) PCT.

The wording 'connected to a surface' used in claim 1 is vague and unclear and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject matter of said claim unclear.

2 Art. 33 PCT

The present application does not meet the criteria of Art. 33(2) PCT, because the subject matter of independent claims 1,9,15 is not new.

2.1 Claim 1:

D1 discloses (paragraphs 17-25 and Figs. 1-6) a semiconductor device comprising:
a substrate (101,201,301,401,501), an epitaxial growth layer stack including a light emitting layer (104,204,304,404,504) and a p-type nitride semiconductor contact layer (101,201,301,401,501) onto said substrate, and a multilayer electrode (605a,605b,613,606a,606b) onto said p-type nitride semiconductor contact layer, wherein said multilayer electrode includes a palladium oxide layer (605a).
The subject matter of independent claim 1 is therefore not new.

The subject matter of independent claim 1 is furthermore not new when considering D2 (page 18, line 11 - page 22, line 24 and Fig. 15) or D3 (column 2, line 41 - column 3, line 59 and Figs. 1-4).

2.2 Claims 9,15:

D2 discloses (page 17, line 30 - page 22, line 24 and Fig. 15) a method for manufacturing a semiconductor light emitting device comprising:
forming an epitaxial growth layer stack including a light emitting layer and p-type nitride

semiconductor contact layer (1101) onto a substrate, depositing a multilayer electrode (1102,1103,1104) onto said p-type nitride semiconductor contact layer, whereby said multilayer electrode includes a palladium layer (1102) adjacent to said p-type nitride semiconductor contact layer, and forming a palladium oxide film by annealing said palladium layer in an oxygen ambience.
The subject matter of independent claims 9,15 is therefore not new.

2.3 Claims 4-9,11-13,17-19:
Dependent claims 4-9,11-13,17-19 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Art. 33(2) and (3) PCT).

Re Item VIII

The present application does not meet the requirements of Art. 6 PCT, in that the subject matter for which protection is sought is not fully supported by the description.

Claim 9 broadly defines the feature that 'a palladium film is deposited onto a p-type semiconductor layer and a palladium oxide film is formed by annealing said semiconductor layer in an oxygen ambience'. However, the description and drawings (page 1, lines 7-10 and page 2, lines 5-12) convey the impression that these functions can only be carried out in a particular way, namely by 'depositing a palladium film onto a p-type nitride semiconductor layer and forming a palladium oxide film by annealing said palladium film (and said p-type nitride semiconductor layer) in an oxygen ambience', and no alternative means are envisaged.

Similarly, claim 15 broadly defines the feature that 'an epitaxial growth layer including a p-type contact layer is formed on a substrate, a palladium film is deposited onto said p-type contact layer, and a palladium oxide film is formed by annealing said substrate in an oxygen ambience', whereas the description and drawings (page 1, lines 7-10 and page 2, lines 5-12) convey the impression that these functions can only be carried out in a particular way, namely by 'forming an epitaxial growth layer stack including a p-type nitride semiconductor contact layer onto a substrate, depositing a palladium film onto said p-type nitride semiconductor contact layer and forming a palladium oxide film by annealing said palladium film (and said p-type nitride semiconductor contact layer) in an oxygen ambience', and no alternative means are envisaged.

Hence, the subject matter of claims 9,15 are not fully supported by the description as required by Art. 6 PCT because its scope is broader than justified by the description and drawings.

The present application does furthermore not meet the requirements of Art. 6 PCT, in that claims 9 and 15 have been drafted as two separate independent method claims. The subject matter for which protection is sought is therefore not concise.